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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/943,365  | 08/29/2001  | Geoffrey B. Rhoads   | P0427               | 7761             |
| 23735   | 7590        | 10/20/2004           | EXAMINER            |                  |
| DIGIMARC CORPORATION<br>9405 SW GEMINI DRIVE<br>BEAVERTON, OR 97008 |             |                      | KRONENTHAL, CRAIG W |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2623                |                  |

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 09/943,365             | RHOADS, GEOFFREY B. |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Craig W Kronenthal     | 2623                |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____.  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____.   | 6) <input type="checkbox"/> Other: ____.                                    |

***Claim Objections***

1. Claim 6 is objected to because of the following informalities:

- On page 110, line 20 claim 6 reads “the method of claim 11”. It is believed that this should be replaced with “the method of claim 1”.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 7, 8, and 14-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Rhoads (PN 5,850,481).

Regarding Claim 1: Rhoads discloses a method of associating technical exposure information within an image (col. 14 lines 58-61), characterized in that the image is steganographically encoded with plural bit information (col. 14 lines 9-11), the plural bit information representing the exposure information, so that when the image is represented in the pixel domain, the steganographic encoding takes the form of slight

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changes in the values of the image pixels (col. 14 lines 51-55). The N-bit identification word is a serial number unique to each frame of film indicating the frame's respective exposure level, which is a type of technical exposure information.

Regarding Claims 7 and 14: Rhoads discloses a printed image formed by printing the encoded image of claim 1 onto a substrate (col. 13 line 66 – col. 14 line 2).

Regarding Claim 8: Rhoads discloses a method of associating technical exposure information within an image (col. 14 lines 58-61), characterized in that the image is steganographically encoded with plural bit information (col. 14 lines 9-11), the plural bit information representing information used in linking to a data repository (Fig. 6, 216) containing the exposure information (col. 18 line 30), so that when the image is represented in the pixel domain, the steganographic encoding takes the form of slight changes in the values of the image pixels (col. 14 lines 51-55). In this embodiment, the plural bits indicate an address used by a register to link or locate corresponding exposure information. The multi-bit identification code word stored in the register (216) is a serial number unique to each frame of film indicating the frame's respective exposure level, which is a type of technical exposure information.

Regarding Claim 15: Rhoads discloses a method of determining technical exposure information associated with an image, characterized by steganographically decoding plural bit information from the image, said plural bit information taking the form of slight

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changes to pixel values when the image is represented in the pixel domain, the method further including determining the technical exposure information by reference to said plural bit information (col. 18 lines 48-50). In fact, Rhoads describes several methods for decoding steganographically encoded plural bit information. It is inherent that Rhoads detects technical exposure information associated with an image since it explains that a multi-bit identification code is stored in a register (Fig. 6, 216) (col. 18, line 30). Rhoads previous to this disclosure, explained that the N-bit identification code is a serial number (col. 14 lines 9-11) and furthermore that the serial number may indicate exposure level (col. 14 lines 58-61), which is one type of technical exposure information. Rhoads also discloses the technical exposure information to take the form of slight changes to pixel values when the image is represented in the pixel domain (col. 14 lines 51-55). Again it is inherent in Rhoads that the technical exposure information be determined by reference to plural bit information. Since the serial number indicates the technical exposure information when it is embedded and is not altered, then it would refer to the technical exposure information when decoded.

Regarding Claim 16: Rhoads discloses the method of claim 15, in which the determining includes using the plural bit information in linking to a data repository containing the technical exposure information. Again it is inherent in Rhoads that the technical exposure information is determined using plural bit information linking to a data repository (register, 216). Since the serial number may also be used as an address to a register (216) storing the exposure information when embedded, then the

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decoded bits would refer to the same addresses of the register (216) indicating the technical exposure information.

Regarding Claim 17: Rhoads discloses the method of claim 15, that includes scanning a printed image to obtain image data on which the method is practiced (col. 17, lines 9-14).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 9, and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Rhoads in view of Kido et al. (PN 5,905,922).

Regarding Claims 2, 9, and 18: Rhoads discloses the method of claim 1 including embedded technical exposure information, but does not disclose this information to specifically be film speed. Kido discloses the embedding of a bar code (Fig. 1, 27) indicating film speed on film to be used in a camera (col. 2 lines 30-35). It would be obvious for one ordinarily skilled in the art to modify Rhoads' plural bit information to include film speed because embedded bits like bar codes are a means for encoding

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important information. Bar codes belonging to film may be represented by bits when film is converted into a digital image. Furthermore, one would be motivated to make this modification in order to provide automatic digital image processing.

6. Claim 3, 10, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhoads in view of Bender et al. (PN 5,689,587). (hereinafter Bender)

Regarding Claims 3, 10, and 19: Rhoads discloses the method of claim 1, however Rhoads does not disclose the N-bit identification word being dispersed throughout the image. However, Bender teaches a method of watermark embedding in which the plural bit information is dispersed across the image rather than being localized in a limited portion (col. 7 lines 44-53). Bender explains that the encoding information does not need to be bungled into a predetermined n number of sets, and instead dispersed to a number of locations. It is obvious to one of ordinary skill in the art of watermarking to combine Bender's use of dispersing the encoded bits with Rhoads' method of encoding bits for the purpose of increasing the difficulty of reassembly of the plurality of bits by an unauthorized decoder. One would be motivated to do so to address the issues of piracy as stressed by Rhoads (col. 3 lines 31-38).

7. Claims 4-6, 11-13, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhoads in view of Fudge et al. (Pub. No. US 2002/0191810 A1). (hereinafter Fudge)

Regarding Claims 4, 11, and 20: Rhoads discloses the method of claim 1, however it does not disclose encoding utilizing pseudo-random noise data. Instead, Fudge discloses the a method similar to claim 1, in which the plural bit information is encoded in accordance with pseudo-random noise data ([0092] first sentence). Fudge's DES engine (Fig. 5, 432) generates the pseudo-random noise data which is then inputted to the XOR combiner (Fig. 5, 433) for encoding the bits. It is obvious to one of ordinary skill in the art of watermarking to combine Fudge's use of pseudo-random noise data for encoding bits with Rhoads' method of encoding bits for the purpose of dispersing the bits thereby increasing the difficulty of reassembly of the plurality of bits by an unauthorized decoder. One would be motivated to do so to address the issues of piracy as stressed by Rhoads (col. 3 lines 31-38).

Regarding Claims 5, 12, and 21: Rhoads discloses the method of claim 1, however it does not disclose changing of several bits to affect a single pixel. Instead, Fudge discloses the method similar to claim 1, wherein a change to a single image pixel is a function of the values of several of said plural bits of information (p. 4, [0041], last sentence). Fudge explains that each pixel is represented by up to 10 bits. Changing the values of several of these bits would change the luminance or color of the pixel. It is obvious to one skilled in the art of watermarking to represent a single pixel with multiple bits so that the original image pixels would only be slightly changed when watermarked. One would be motivated to make these slight changes to minimize the effects on the



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original information while encoding the image with watermark information unperceivable to the human eye as desired by Rhoads (col. 3 lines 39-42).

Regarding Claims 6, 13, and 22: Rhoads discloses the method of claim 1, however it does not disclose the change in luminance of a majority of the image pixels. Instead, Fudge discloses the method similar to claim 1, in which the encoding changes the luminance of a majority of the image pixels (p. 9, [0096], 5<sup>th</sup> and 6<sup>th</sup> sentences). Fudge explains that watermarking will have an effect on several pixels and that watermarking would be done on a lot of the image. Fudge also explains that this watermarking affects the luminance component of the image (p. 9, [0096], first sentence). It would be obvious to one ordinarily skilled in the art or watermarking to modify Rhoads' method of watermarking with Fudge so that the encoding changes the luminance of the majority of the image pixels. One would be motivated to make this modification for the purpose of providing a sufficient amount of watermark information and repeating the watermark information so that the decoding process is efficient and accurate. Furthermore, one would be motivated to make these changes to complicate the process of copying and thereby deterring unauthorized reproduction.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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- Matsumura et al. (Pub. No. US 2003/0012404 A1) is cited for teaching digital watermark embedding based on detected motion information.
- Lee et al. (PN 5,901,178) is cited for teaching the embedding of data in a video according to a pseudo-noise signal and the use of plural bits to represent characteristics of a single pixel.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig W Kronenthal whose telephone number is (703) 305-8696. The examiner can normally be reached on 8:00 am - 5:00 pm / Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 306-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CWK  
10/08/04

MEHRDAD DASTOURI  
PRIMARY EXAMINER

*Mehrdad Dastouri*